LISTING OF CLAIMS:

1. (Currently amended) A safety apparatus for automobile crash, comprising:

at least one imaging means for repeatedly picking up a passenger's head image including a passenger on a seat;

extracting means for extracting passenger's information on the basis of the passenger's head image;

safety means for protecting said passenger from said automobile crash; and

controlling means for controlling said safety means on the basis of said passenger's information,

wherein said extracting means:

stores reference images similar to head outlines, a part of which is a part of an ellipse;

detects a head ellipse from the passenger's head image outputted from said imaging means at a first time;

stores the detected head ellipse of the first time in a form of parameters defining the head ellipse;

judges whether the head ellipse of the first time stored in the form of the parameters is almost the same as one of said reference images;

decides the passenger's information responsive to one of the reference images when the head ellipse of the ~~passenger's head image~~first time is almost the same as the one of the reference images; ~~and~~

outputs said decided passenger's information of the first time to the safety means;

stores the detected head ellipse as a reference image;

detects a head ellipse from the passenger's head image outputted from said imaging means at a second time coming after the first time only in a region including the head ellipse detected at the first time;

stores the detected head ellipse of the second time in a form of parameters defining the head ellipse;

judges whether the head ellipse of the second time stored in the form of the parameters is almost the same as one of said reference images;

when the head ellipse of the second time differs from any of the reference images, detects a head ellipse from the passenger's head image at a third time coming after the second time in a whole of a two-dimensional image area;

stores the detected head ellipse of the third time in the form of the parameters;

judges whether the head ellipse of the third time is almost the same as one of said reference images;

decides the passenger's information responsive to one of the reference images when the head ellipse of the third time is almost the same as the one of the reference images; and

outputs the decided passenger's information of the third time to the safety means.

2. (Canceled)

3. (Previously presented) The safety apparatus according to claim 1, wherein said safety means is an air bag.

4. (Currently amended) The safety apparatus according to claim 1, wherein:

said reference images represent kinds of ~~said~~ passengers; and

said passenger's information ~~is~~ represents one of said kinds of said passengers.

5. (Original) The safety apparatus according to claim 1, wherein said extracting means determines that said seat is vacant, if any image almost the same as that of said passenger can not be selected.

6. (Currently amended) The safety apparatus according to claim 1, wherein said passenger's information ~~is~~ represents a position of said passenger along the front-rear direction.

Claims 7-10 (Canceled)

11. (Currently amended) ~~The~~ A safety apparatus ~~according to claim 9, wherein~~for automobile crash, comprising:

at least one imaging means for picking up a passenger's head image including a passenger on a seat;

extracting means for extracting passenger's information on the basis of the passenger's head image;

safety means for protecting said passenger from said automobile crash; and

controlling means for controlling said safety means on the basis of said passenger's information,

wherein said extracting means:

stores reference images similar to head outlines, a part of which is a part of an ellipse;

detects a head ellipse from the passenger's head image outputted from said imaging means;

stores the detected head ellipse in a form of parameters defining the head ellipse;

judges whether the head ellipse stored in the form of the parameters is almost the same as one of said reference images;

decides the passenger's information responsive to one of the reference images when the head ellipse of the passenger's head image is almost the same as the one of the reference images; and

outputs said decided passenger's information to the safety means wherein said reference images include the detected head ellipse;

wherein a region including said detected head ellipse is processed at a time to come;

wherein only said region is processed; and

when any image was not detected within said region, a whole of a two dimensional image area is further continuously processed.

12. (Canceled)

13. (Original) The safety apparatus according to claim 1, wherein said imaging means is or are disposed at a lateral side of said seat.

14. (Canceled)

15. (Previously presented) The safety apparatus according to claim 1, wherein said imaging means are disposed at a lateral side and a front side of said seat.

16. (Previously presented) The safety apparatus according to claim 1, wherein said imaging means is a stereo range finder having two sensors.

17. (Previously presented) The safety apparatus according to claim 16, wherein the stereo range finder enlarges or reduces a picked-up image in accordance with a position of the passenger's head measured by said stereo range finder.

18. (Previously presented) The safety apparatus according to claim 1, wherein said reference image is limited to said ellipse.

19. (Previously presented) The safety apparatus according to according to claim 18, wherein a shape and position of said head ellipse expressed by the parameters are employed for selecting one of said reference images almost the same as that of said passenger.

20. (Currently amended) The safety apparatus ~~according to claim 1, wherein~~for automobile crash, comprising:

at least one imaging means for picking up a passenger's head image including a passenger on a seat;

extracting means for extracting passenger's information on the basis of the passenger's head image;

safety means for protecting said passenger from said automobile crash; and

controlling means for controlling said safety means on the basis of said passenger's information,

wherein said extracting means:

stores reference images similar to head outlines, a part of which is a part of an ellipse;

detects a head ellipse from the passenger's head image outputted from said imaging means;

stores the detected head ellipse in a form of parameters defining the head ellipse;

judges whether the head ellipse stored in the form of the parameters is almost the same as one of said reference images;

decides the passenger's information responsive to one of the reference images when the head ellipse of the passenger's head image is almost the same as the one of the reference images; and

outputs said decided passenger's information to the safety means;

wherein the form of the parameters includes at least one of a length of a major axis, a length of a minor axis, values of a center coordinate, an inclination of the major axis and ellipticity.

21. (Previously presented) A safety apparatus for automobile crash, comprising:

at least one imaging means for picking up a passenger's head image including a passenger on a seat;

extracting means for extracting passenger's information responsive to the passenger's head image;

safety means for protecting the passenger from the automobile crash; and

controlling means for controlling the safety means responsive to the passenger's information;

wherein the extracting means:

stores reference ellipses similar to head outlines;

picks up a first passenger's head image of the passenger in a predetermined processing region denoting a part of a two dimensional image area;

tries to detect a head ellipse from the first passenger's head image picked up in the predetermined processing region;

picks up a second passenger's head image of the passenger in a whole of the two dimensional image area when no head ellipse is detected from the first passenger's head image;

detects a head ellipse from the second passenger's head image picked up in the whole of the two dimensional image area;

stores the detected head ellipse in a form of parameters defining the head ellipse;

compares a shape and a position of the detected head ellipse expressed by the parameters with each of the reference ellipses to obtain comparison results;

judges responsive to the comparison results whether the head ellipse stored in the form of the parameters is almost the same as one of the reference ellipses;

decides the passenger's information responsive to one of the reference images when the head ellipse of the passenger's head image is almost the same as the one of the reference images; and

outputs the decided passenger's information to the safety means.

22. (Previously presented) The safety apparatus according to claim 21, wherein the safety means is an air bag.

23. (Currently amended) The safety apparatus according to claim 21, wherein the reference ellipses represent kinds of passengers, and the passenger's information ~~is~~ represents one of the kinds of passengers.

24. (Previously presented) The safety apparatus according to claim 21, wherein the extracting means determines that the seat is vacant, if any image almost the same as that of the passenger cannot be selected.

25. (Previously presented) The safety apparatus according to claim 21, wherein the passenger's information is a position of the passenger along the front-rear direction.

26. (Previously presented) The safety apparatus according to claim 21, wherein the detected head ellipse of the passenger is added to the reference images.

27. (Previously presented) The safety apparatus according to claim 21, wherein the imaging means is or are disposed at a lateral side of the seat.

28. (Previously presented) The safety apparatus according to claim 21, wherein the imaging means are disposed at both lateral sides of the seat.

29. (Previously presented) The safety apparatus according to claim 21, wherein the imaging means are disposed at a lateral side and a front side of the seat.

30. (Previously presented) The safety apparatus according to claim 21, wherein the imaging means is a stereo range finder having two sensors.

31. (Previously presented) The safety apparatus according to claim 30, wherein the stereo range finder enlarges or reduces a picked-up image in accordance with a position of the passenger's head measured by the stereo range finder.

32. (Previously presented) A safety apparatus for automobile crash, comprising:

at least one imaging means for picking up a passenger's head image including a passenger on a seat;

extracting means for extracting passenger's information responsive to the passenger's head image;

safety means for protecting the passenger from the automobile crash; and

controlling means for controlling the safety means responsive to the passenger's information;

wherein the extracting means:

stores reference images similar to head outlines, a part of which is a part of an ellipse;

detects a head ellipse responsive to the passenger's head image outputted from the imaging means;

selects one of the reference images almost the same as that of the passenger;

decides the passenger's information responsive to the selected reference image; and

outputs the decided passenger's information to the safety means,

wherein the imaging means are disposed at both lateral sides of the seat.